

Name: _____




Date: _____

Exam: Function Reflections (Solution version 46)

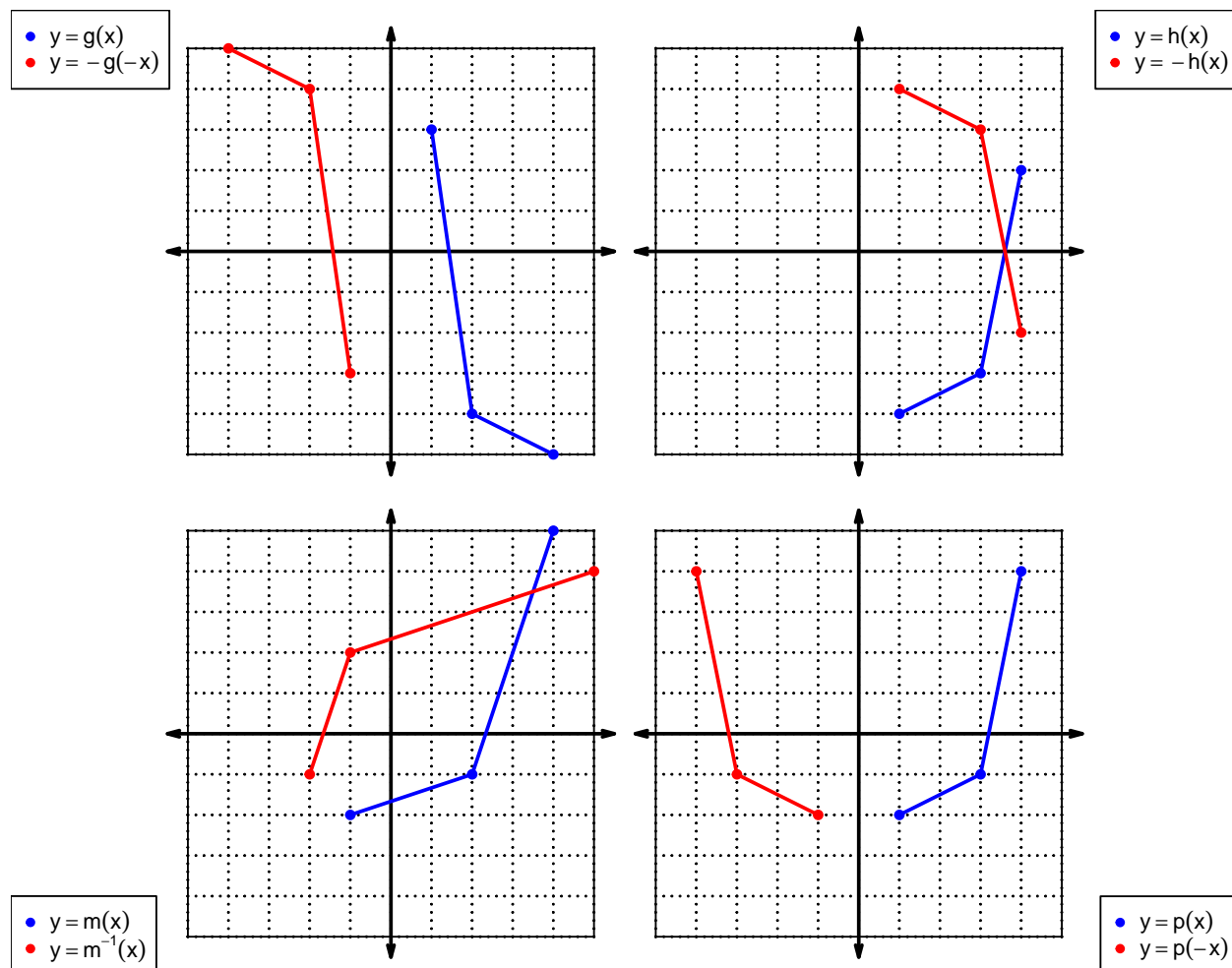
1. Let function f be defined by the polynomial below:

$$f(x) = -7x^5 + 2x^4 + 5x^3 - 9x^2 - 3x - 8$$

Draw lines that match each function reflection with its polynomial:

Reflections		Polynomials
$-f(-x)$		$7x^5 - 2x^4 - 5x^3 + 9x^2 + 3x + 8$
$-f(x)$		$-7x^5 - 2x^4 + 5x^3 + 9x^2 - 3x + 8$
$f(-x)$		$7x^5 + 2x^4 - 5x^3 - 9x^2 + 3x - 8$

2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f , g , and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	8	2	4
2	2	7	5
3	7	4	2
4	6	5	9
5	3	6	1
6	9	1	6
7	4	9	3
8	5	3	7
9	1	8	8

3. Evaluate $g(5)$.

$$g(5) = 6$$

4. Evaluate $h^{-1}(4)$.

$$h^{-1}(4) = 1$$

5. Assuming h is an **odd** function, evaluate $h(-9)$.

If function h is odd, then

$$h(-9) = -8$$

6. Assuming f is an **even** function, evaluate $f(-3)$.

If function f is even, then

$$f(-3) = 7$$

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7. A function, f , is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g , is **odd** if $g(x) = -g(-x)$ for all x in the domain.

Let polynomial p be defined with the following equation:

$$p(x) = x^2 - x$$

- a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = (-x)^2 - (-x)$$

$$p(-x) = x^2 + x$$

- b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -(x^2 + x)$$

$$-p(-x) = -x^2 - x$$

- c. Is polynomial p even, odd, or neither?

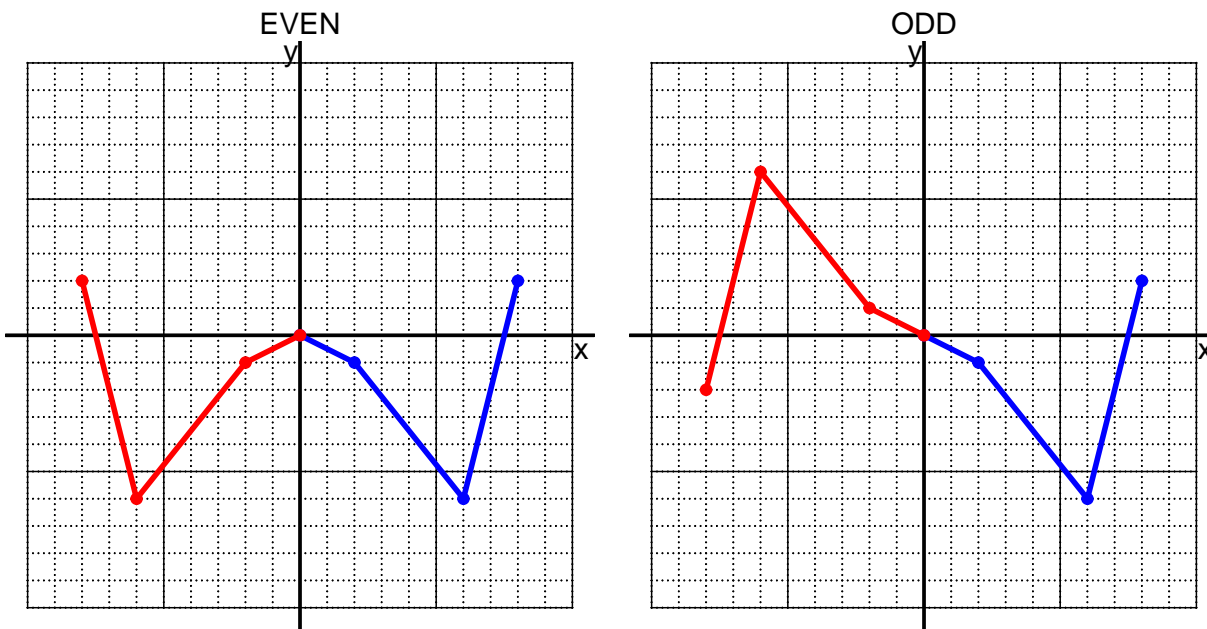
neither

- d. Explain how you know the answer to part c.

We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

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8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function f be defined with the equation below.

$$f(x) = 8(x + 9)$$

- a. Evaluate $f(2)$.

step 1: add 9
step 2: multiply by 8

$$f(2) = 8((2) + 9)$$

$$f(2) = 88$$

- b. Evaluate $f^{-1}(96)$.

step 1: divide by 8
step 2: subtract 9

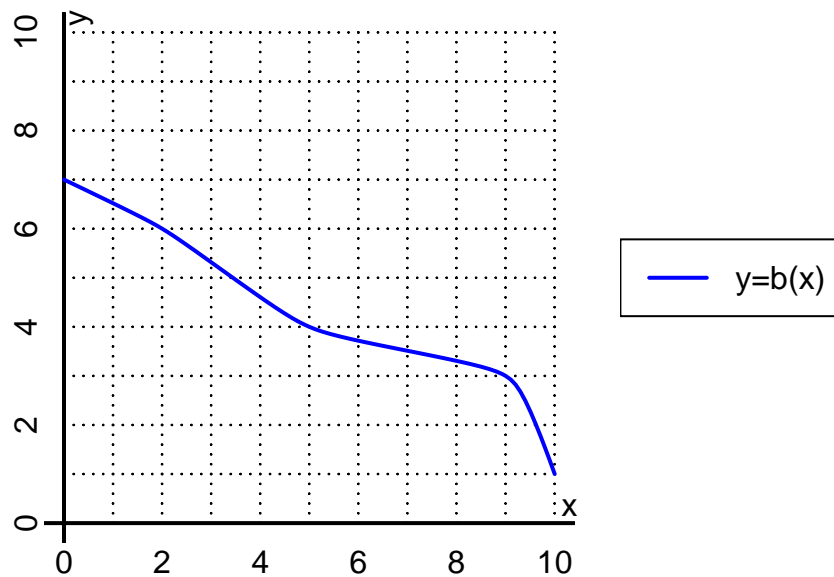
$$f^{-1}(x) = \frac{x}{8} - 9$$

$$f^{-1}(96) = \frac{(96)}{8} - 9$$

$$f^{-1}(96) = 3$$

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10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(5)$.

$$b(5) = 4$$

b. Evaluate $b^{-1}(6)$.

$$b^{-1}(6) = 2$$

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11. Function f is defined by the table below.

a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	7	-7	7	-7
-1	-6	6	-6	6
0	0	0	0	0
1	-6	6	-6	6
2	7	-7	7	-7

b. Is function f even, odd, or neither?

even

c. How do you know the answer to part b?

Function f is even because column $f(-x)$ matches column $f(x)$ exactly.